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     FILE 'HCAPLUS' ENTERED AT 15:29:02 ON 01 OCT 2008
L1        183000 S STARCH OR AMYLOPECTIN
L2         59635 S BRANCHING
L3         11978 S GELATINIZ?
L4            47 S L1 AND L2 AND L3
L5            18 S L4 AND (PY<2000 OR AY<2000 OR PRY<2000)
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FILE COVERS 1907 - 1 Oct 2008  VOL 149 ISS 14
FILE LAST UPDATED: 30 Sep 2008  (20080930/ED)

HCAplus now includes complete International Patent Classification (IPC)
reclassification data for the second quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> s starch or amylopectin
        181199 STARCH
          7183 AMYLOPECTIN
L1      183000 STARCH OR AMYLOPECTIN

=> s branching
L2       59635 BRANCHING

=> s gelatiniz?
L3       11978 GELATINIZ?

=> s l1 and l2 and l3
L4           47 L1 AND L2 AND L3

=> s l4 and (PY<2000 or AY<2000 or PRY<2000)
      20096092 PY<2000
       3696782 AY<2000
       3160478 PRY<2000
L5           18 L4 AND (PY<2000 OR AY<2000 OR PRY<2000)

=> d l5 1-18 ti abs bib

L5   ANSWER 1 OF 18  HCAPLUS  COPYRIGHT 2008 ACS on STN
TI   Starch synthase from Canna edulis, its protein and cDNA sequence
     and their use in the production of new starches
AB   The invention provides isolated nucleic acids and their encoded proteins
     that are involved in starch biosynthesis.  The invention further
     provides recombinant expression cassettes, host cells, transgenic plants,
     and antibody compns.  These nucleic acid mols. can be used to produce
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transgenic plants having altered structure or quality of starch. The present invention provides methods and compns. relating to altering the amount and/or morphol. of starch in plants.

AN 2002:551632 HCAPLUS <<LOGINID::20081001>>

DN 137:104816

TI Starch synthase from Canna edulis, its protein and cDNA sequence and their use in the production of new starches

IN Singletary, George W.; Zhou, Lan

PA Pioneer Hi-Bred International, Inc., USA

SO U.S., 47 pp.
CODEN: USXXAM

DT Patent

LA English

FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 6423886	B1	20020723	US 1999-388743	19990902 <--
US 20030135883	A1	20030717	US 2002-44543	20020111 <--
US 6734341	B2	20040511		
PRAI US 1999-388743	A	19990902 <--		

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN

TI Starch branching enzyme II (SBEII-1 and SBEII-2) isoforms from wheat, cDNA, transgenic plants, and altering starch properties for food use

AB A class of wheat SBEII genes, SBEII-1, recombinant protein expression in transgenic plants, and its use in altering properties of starch produced by a plant are claimed. Starch properties include the gelatinization onset and/or peak temperature The use of such starch with altered properties in food stuff, particularly bakery products is also claimed. CDNA clones for SBEII were isolated and sequenced. Those clones were divided into two sub-classes, SBEII-1 and SBEII-2 having sequence homol. to maize SBEIIb and SBEIIa, resp. These genes were mapped to the long arm of wheat group 2 homologous chromosomes. Some of those isoforms were expressed as recombinant protein in wheat. Differential scanning calorimetry studies showed that starch produced in transgenic wheat transformed with expression construct for SBEII displayed higher onset, peak, and end temperature for gelatinization.

AN 2000:191230 HCAPLUS <<LOGINID::20081001>>

DN 132:247996

TI Starch branching enzyme II (SBEII-1 and SBEII-2) isoforms from wheat, cDNA, transgenic plants, and altering starch properties for food use

IN Goldsbrough, Andrew; Colliver, Steve

PA Plant Breeding International Cambridge Ltd., UK

SO PCT Int. Appl., 198 pp.
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2000015810	A1	20000323	WO 1999-GB3011	19990909 <--
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW				

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        RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
            ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG,
            CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     AU 9958725          A     20000403    AU 1999-58725          19990909 <--
     AU 767103           B2    20031030
     EP 1117814          A1    20010725    EP 1999-946307         19990909 <--
        R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
           IE, SI, LT, LV, FI, RO
     HU 2001003618       A2    20020128    HU 2001-3618           19990909 <--
     HU 2001003618       A3    20031229
     US 6730825          B1    20040504    US 2001-786480         20010917 <--
     US 20040216188      A1    20041028    US 2004-818770         20040406 <--
     US 7217857          B2    20070515
     US 20080064864      A1    20080313    US 2007-788837         20070419 <--
PRAI EP 1998-307337      A     19980910  <--
     WO 1999-GB3011      W     19990909  <--
     US 2001-786480      A3    20010917
     US 2004-818770      A3    20040406
RE.CNT  4     THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5   ANSWER 3 OF 18  HCAPLUS  COPYRIGHT 2008 ACS on STN
TI   Molecular background of technological properties of selected starches
AB   Selected starches, i.e. waxy maize, amaranth, quinoa, wheat, millet, and
     buckwheat starches, were investigated with respect to their technol.
     properties such as gelatinization, stability to mech. stress,
     resistance to conditions, and stability in continuous freeze/thaw cycles.
     Technol. properties are correlated with mol. features such as
     branching characteristics in terms of iodine-complexing potential,
     molar mass, occupied glucan-coil volume, packing d. of glucan coils, and
     rheol. properties.  Waxy maize and amaranth starches were found to be
     amylopectin-type short-chain branched (scb) glucans with weight average
     molar masses Mw = 17 + 106 and 12 + 106 g/mol, resp.  Waxy
     maize starch had a high gelatinization potential, high
     viscosity at 95° (340 mPas) low stability at acidic conditions, average
     stability to shearing, and good freeze/thaw stability.  For amaranth
     starch a viscosity of 122 mPas at 95°, low resistance to
     acid, but high stability to applied shearing, and even high freeze/thaw
     stability was determined  Investigated quinoa starch was classified
     as scb-type glucan, however, the branches are significantly longer than
     those of waxy maize and amaranth.  With a Mw = 11 + 106 g/mol and a
     viscosity of 187 mPas at 95°, this sample is comparably resistant
     to acidic conditions and to shearing, but instable in freeze/thaw expts.
     Wheat, millet, and buckwheat starches contain significant percentages of
     amylose-type long-chain branched (lcb) glucans (22.1, 32.1, and 24.3%,
     resp.) with Mw values of 5 + 106, 12 + 106, and 15 + 106
     g/mol, resp.  Wheat starch, with a viscosity of 107 mPas at
     95°, shows low stability under acidic conditions, but high
     stability to shearing.  Wheat and millet starches, but not buckwheat
     starch, form weak gels in the course of subsequent freeze/thaw
     cycles.  Millet starch, with a viscosity of 101 mPas at
     95° was found to be moderately stable under acidic conditions and
     to shearing.  Buckwheat starch with a viscosity of 230 mPas at
     95° shows no acid resistance and is instable upon shearing but
     performs very well in freeze/thaw expts.
AN   1999:550347  HCAPLUS <<LOGINID::20081001>>
DN   131:171807
TI   Molecular background of technological properties of selected starches
AU   Praznik, Werner; Mundigler, Norbert; Kogler, Andreas; Pelzl, Bernhard;
     Huber, Anton
CS   Institut Chemie, Univ. Bodenkultur, Vienna, A-1190, Austria
```

SO Starch/Staerke (1999), 51(6), 197-211
CODEN: STARDD; ISSN: 0038-9056
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Determination of the distribution of glucose polymers of amylopectin using MALDI-TOF.
AB The amount of energy required to gelatinize rice can be crudely determined using the amylose/amylopectin ratio of starch in the rice. However, true energy (cooking time/temperature) requirements are often quite different than predicted values. These discrepancies result in an inconsistent product within the par-boiled rice industry. The differing degree of branching within the amylopectin starch is suspected as the major variable. Current technol. uses gel permeation chromatog. to sep. the debranched chains of amylopectin (glucose polymers) to provide a rudimentary idea of the amylopectin structure. Matrix assisted laser desorption/ionization - Time of Flight Mass Spectrometry (MALDI-TOF) provides a more accurate determination in much less time (45 min vs 5 min). Glucose units with a single Na+ cation attached start at six units and increase in intensity up to 11 units then decrease down to 25 units. It is this distribution of debranched chains that is believed to affect the cooking properties of rice.
AN 1999:539290 HCAPLUS <<LOGINID::20081001>>
TI Determination of the distribution of glucose polymers of amylopectin using MALDI-TOF.
AU Grimm, Deborah A.; Grimm, Casey C.
CS Coordinated Instrumentation Facility, Tulane University, New Orleans, LA, 70118-5698, USA
SO Book of Abstracts, 218th ACS National Meeting, New Orleans, Aug. 22-26 (1999), AGFD-055 Publisher: American Chemical Society, Washington, D. C.
CODEN: 67ZJA5
DT Conference; Meeting Abstract
LA English

L5 ANSWER 5 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI A process for textile warp sizing using enzymatically modified starches
AB The process comprises the steps of treating a suspension of gelatinized starch with an enzyme selected from the group consisting of cyclodextrin glycosyltransferase, glycosyltransferase and branching enzymes so as to reduce the viscosity of the suspension, and applying the treated starch suspension to textile fibers.
AN 1999:451408 HCAPLUS <<LOGINID::20081001>>
DN 131:89051
TI A process for textile warp sizing using enzymatically modified starches
IN Hendriksen, Hanne Vang; Pedersen, Sven; Bisgard-Frantzen, Henrik
PA Novo Nordisk A/S, Den.
SO PCT Int. Appl., 17 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9935325	A1	19990715	WO 1998-DK564	19981218 <--

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         W:  AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE,
             DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP,
             KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN,
             MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
             TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES,
             FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI,
             CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
    AU 9916637          A     19990726    AU 1999-16637          19981218 <--
PRAI DK 1997-1555       A     19971230  <--
    WO 1998-DK564       W     19981218  <--
RE.CNT  3     THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5  ANSWER 6 OF 18  HCAPLUS  COPYRIGHT 2008 ACS on STN
TI  Consequences of antisense RNA inhibition of starch
    branching enzyme activity on properties of potato starch
AB  Antisense constructs containing cDNAs for potato starch
    branching enzyme (SBE) were introduced into potato (Solanum
    tuberosum L.). A population of transgenic plants were generated in which
    tuber SBE activity was reduced by between 5 and 98% of control values.  No
    significant differences in amylose content or amylopectin branch
    length profiles of transgenic tuber starches were observed as a function of
    tuber SBE activity.  Starches obtained from low SBE activity plants showed
    elevated phosphorus content.  31P-NMR anal. showed that this was due to
    proportionate increases in both 3- and 6-linked starch
    phosphates.  A consistent alteration in starch
    gelatinization properties was only observed when the level of SBE
    activity was reduced to below .apprx.5% of that of control values.
    Starches from these low SBE activity plants showed increases of up to
    5°C in d.s.c. peak temperature and viscosity onset temperature  Studies on
    melting of crystallites obtained from linear (1 →
    4)-α-D-glucan oligomers suggest that an average difference of double
    helix length of about one glucose residue might be sufficient to account
    for the observed differences in gelatinization properties.  It is
    postulated that the modification of gelatinization properties at
    low SBE activities is due to a subtle alteration in amylopectin
    branch patterns resulting in small changes in double helix lengths within
    granules.
AN  1998:508745  HCAPLUS <<LOGINID::20081001>>
DN  129:214130
OREF 129:43447a,43450a
TI  Consequences of antisense RNA inhibition of starch
    branching enzyme activity on properties of potato starch
AU  Safford, Richard; Jobling, Steve A.; Sidebottom, Chris M.; Westcott, Roger
    J.; Cooke, David; Tober, Karen J.; Strongitharm, Barbara H.; Russell,
    Alison L.; Gidley, Michael J.
CS  Biosciences Division, Unilever Research, Sharnbrook, MK 441LQ, UK
SO  Carbohydrate Polymers (1998), 35(3-4), 155-168
    CODEN: CAPOD8; ISSN: 0144-8617
PB  Elsevier Science Ltd.
DT  Journal
LA  English
RE.CNT  38    THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5  ANSWER 7 OF 18  HCAPLUS  COPYRIGHT 2008 ACS on STN
TI  Manufacture of gelatinized starch liquid with high
    transparency
AB  The title liquid, when incorporated into food-based oils or higher fatty
    acid alkali salts causing no discoloration and odor due to oxidative
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deterioration, is obtained from starch degradation products having >50% fraction with mol. weight range of 20,000-2,500,000, starch degradation products having DE (dextrin equiv) of 1-20, or starch degradation products having cyclic structure and mol. weight of 8000-800,000. Starch degradation products with cyclic structure can be formed by treating a starch compound or mixture with branching enzymes.

AN 1998:42073 HCAPLUS <<LOGINID::20081001>>
DN 128:129399
OREF 128:25397a,25400a
TI Manufacture of gelatinized starch liquid with high transparency
IN Nakamura, Hiroyasu; Hama, Yoshiaki; Okamoto, Harumi; Miyaki, Yasutomo
PA Ezaki Glico Co., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10008026	A	19980113	JP 1996-180061	19960619 <--
	JP 3025869	B2	20000327		
PRAI	JP 1996-180061		19960619	<--	

L5 ANSWER 8 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Starch biosynthesis and modification of starch structure in transgenic plants
AB Starch is synthesized through the ADP-glucose pathway, involving the 3 enzymes ADP-glucose pyrophosphorylase, starch synthase, and starch-branching enzyme. ADP-glucose pyrophosphorylase is the key enzyme of the pathway, determining the flux of C into starch. It generates ADP-glucose, which is the substrate for the starch synthases, from glucose-1-phosphate and ATP releasing pyrophosphate. The enzyme is stimulated by 3-phosphoglycerate and inhibited through inorg. phosphate. The starch synthases, which catalyze the transfer of glucose from ADP-glucose to the nonreducing end of a growing α-1,4-glucan, are divided into 2 classes, the granule-bound starch synthases (GBSS) and the soluble starch synthases (SS). In both classes several isoforms were described from many different plant species. The branching enzyme, which introduces branch points into the amylopectin, can also occur in different isoforms. Other enzymes present in plants, which also act on α-1,4-glucans, such as the starch phosphorylases, disproportionating enzyme and different starch hydrolases, might also be important for determining the starch structure and, therefore, its processibility. Many aspects of starch synthesis are not fully understood to date. Starch metabolism can be manipulated through genetic engineering, either by the ectopic expression of different heterologous genes, or through the repression of the expression of endogenous genes using antisense RNA technol. This not only allows the functional anal. of starch biosynthetic proteins, but also the manipulation of starch structure in order to widen its industrial applications. In this way many different potato lines were generated, containing either different amts. of starch, or which synthesize a structurally modified starch . These structural changes relate to the amylose content, the phosphate content, or the gelatinization and gelation characteristics of the starch.
AN 1997:568887 HCAPLUS <<LOGINID::20081001>>
DN 127:261734

OREF 127:51129a,51132a
TI Starch biosynthesis and modification of starch structure in transgenic plants
AU Kossmann, J.; Buttcher, V.; Abel, G. J. W.; Duwenig, E.; Emmermann, M.; Frohberg, C.; Lloyd, J. R.; Lorberth, R.; Springer, F.; Welsh, T.; Willmitzer, L.
CS Max-Planck-Institut Molekulare Pflanzenphysiologie, Golm, D-14476, Germany
SO Macromolecular Symposia (1997), 120(Functional Polysaccharides II), 29-38
CODEN: MSYMEC; ISSN: 1022-1360
PB Huethig & Wepf
DT Journal
LA English

L5 ANSWER 9 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Physical association of starch biosynthetic enzymes with starch granules of maize endosperm. Granule-associated forms of starch synthase I and starch branching enzyme II
AB Antibodies were used to probe the degree of association of starch biosynthetic enzymes with starch granules isolated from maize (Zea mays) endosperm. Graded washings of the starch granule, followed by release of polypeptides by gelatinization in 2% sodium dodecyl sulfate, enables distinction between strongly and loosely adherent proteins. Mild aqueous washing of granules resulted in near-complete solubilization of ADP-glucose pyrophospyorylase, indicating that little, if any, ADP-glucose pyrophosphorylase is granule associated In contrast, all of the waxy protein plus significant levels of starch synthase I and starch branching enzyme II (BEII) remained granule associated Stringent washings using protease and detergent demonstrated that the waxy protein, more than 85% of total endosperm starch synthase I protein, and more than 45% of BEII protein were strongly associated with starch granules. Rates of polypeptide accumulation within starch granules remained constant during endosperm development. Soluble and granule-derived forms of BEII yielded identical peptide maps and overlapping tryptic fragments closely aligned with deduced amino acid sequences from BEII cDNA clones. These observations provide direct evidence that BEII exists as both soluble and granule-associated entities. Thus, it is concluded that each of the known starch biosynthetic enzymes in maize endosperm exhibits a differential propensity to associate with, or to become irreversibly entrapped within, the starch granule.
AN 1996:436720 HCAPLUS <<LOGINID::20081001>>
DN 125:81944
OREF 125:15407a,15410a
TI Physical association of starch biosynthetic enzymes with starch granules of maize endosperm. Granule-associated forms of starch synthase I and starch branching enzyme II
AU Mu-Forster, Chen; Huang, Rongmin; Powers, Joseph R.; Harriman, Robert W.; Knight, Mary; Singletary, George W.; Keeling, Peter L.; Wasserman, Bruce P.
CS Dep. Food Sci., Rutgers Univ., New Brunswick, NJ, 08903-0231, USA
SO Plant Physiology (1996), 111(3), 821-829
CODEN: PLPHAY; ISSN: 0032-0889
PB American Society of Plant Physiologists
DT Journal
LA English

L5 ANSWER 10 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Starch for use in paper sizing or coating process

AB The title process used an aqueous size or coating liquid containing converted starch obtained by treating gelatinized starch or a gelatinized modified starch in aqueous medium with a starch-converting enzyme selected from cyclodextrin glycosyl transferases (EC 2.4.1.19) and the branching enzymes (EC 2.4.1.18). The preparation of converted starch in this manner is simpler than that of conventional process and gives retrogradation-resistant starch for good workability.
AN 1996:115231 HCAPLUS <<LOGINID::20081001>>
DN 124:149110
OREF 124:27685a,27688a
TI Starch for use in paper sizing or coating process
IN Bruinenberg, Peter Martin; Hulst, Anne Coenraad; Faber, Ate; Voogd, Roeland Huibert
PA Cooeperative Verkoop- en Productievereniging van Aardappelmeel en Derivaten 'AVEBE', Neth.
SO Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 690170	A1	19960103	EP 1995-201751	19950627 <--
	EP 690170	B1	20000906		
	EP 690170	B2	20040225		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
	NL 9401090	A	19960201	NL 1994-1090	19940629 <--
	AT 196172	T	20000915	AT 1995-201751	19950627 <--
	ES 2151575	T3	20010101	ES 1995-201751	19950627 <--
PRAI	NL 1994-1090	A	19940629 <--		

L5 ANSWER 11 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Mutant genes at the r and rb loci affect the structure and physico-chemical properties of pea seed starches
AB Mutant genes at two loci, r and rb, known to encode genes affecting the starch biosynthetic pathway, were studied for their effect on the structure and gelatinization of pea seed starches. Comparisons were made using starches from four lines (RRRbRb, rrRbRb, RRrbrb, and rrrbrb), near-isogenic except for genes at these two loci. All the starches had C-type x-ray diffraction patterns, but different contents of 'A' and 'B' polymorphs. The presence of a mutation at either locus increased the 'B' polymorph content in the starches, although the influence of the r mutation was much greater than that of rb. Differences were discovered in the crystalline structure of the rrRbRb starch which correlated with a high content of amorphous phase as well as with the changes in amylopectin structure. In addition, changes in the crystalline structure of this sample correlated with a lack of cooperative transition during starch gelatinization in excess water. The RRrbrb starch had a greatly increased enthalpy of gelatinization in excess water compared with the wild-type starch. It is proposed that this effect is connected with specific charge interactions between the mols. in the starch granule. The rrrbrb starch had parameters of crystalline structure and gelatinization which reflected the different influences of the two genes. With regard to gelatinization, this starch had relatively wide cooperative transition and low enthalpy and a very high peak temperature of transition.
AN 1996:55346 HCAPLUS <<LOGINID::20081001>>
DN 124:85197
OREF 124:16025a,16028a

TI Mutant genes at the r and rb loci affect the structure and physico-chemical properties of pea seed starches
AU Bogracheva, T. Ya.; Davydova, N. I.; Genin, Ya. V.; Hedley, C. L.
CS Inst. Biochem. Phys., RAS, Moscow, Russia
SO Journal of Experimental Botany (1995), 46(293), 1905-13
CODEN: JEBOA6; ISSN: 0022-0957
PB Oxford University Press
DT Journal
LA English

L5 ANSWER 12 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Modifications of starch during baking: studied through reactivity with amyloglucosidase
AB Conditions that ensure starch hydrolysis by amyloglucosidase in a limited substrate system were worked out. Using these conditions, the degree of access of the enzyme to starch mols. was evaluated in different starch materials. Raw starches of different botanical origins are hydrolyzed at different rates, but starches with limited branching hydrolyze more rapidly. A good example of this is a limit dextrin, which is more susceptible than its parent amylopectin. The effect of gelatinization on the enzymic availability of starch was also studied. It was observed that damaged granules undergo amylolysis much more rapidly than do undamaged ones. Therefore, the extent of amylolysis in a given starch is governed by the degree of granule damage. Starch in bread is hydrolyzed more rapidly and extensively than is that in flour and dough, but no significant differences were found in conventional yeast fermentation between soft and durum wheat. On the other hand, bread obtained by acid fermentation initially undergoes slow amylolysis, although the final level reached is the same as in bread made from the same flour by conventional yeast fermentation
AN 1995:972719 HCAPLUS <<LOGINID::20081001>>
DN 124:28348
OREF 124:5459a,5462a
TI Modifications of starch during baking: studied through reactivity with amyloglucosidase
AU Eynard, Lucia; Guerrieri, Nicoletta; Cerletti, Paolo
CS Dipartimento di Scienze Molecolari Agroalimentari, Universita di Milano, Milan, I-20133, Italy
SO Cereal Chemistry (1995), 72(6), 594-7
CODEN: CECHAF; ISSN: 0009-0352
PB American Association of Cereal Chemists
DT Journal
LA English

L5 ANSWER 13 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Expression of Escherichia coli glycogen synthase in the tubers of transgenic potatoes (Solanum tuberosum) results in a highly branched starch
AB A chimeric gene containing the patatin promoter and the transit-peptide region of the small-subunit carboxylase gene was utilized to direct expression of Escherichia coli glycogen synthase (glgA) to potato (Solanum tuberosum) tuber amyloplasts. Expression of the glgA gene product in tuber amyloplasts was between 0.007 and 0.028% of total protein in independent potato lines as determined by immunoblot anal. Tubers from four transgenic potato lines were found to have a lowered sp. gr., a 30 to 50% reduction in the percentage of starch, and a decreased amylose/amylopectin ratio. Total soluble sugar content in these selected lines was increased by approx. 80%. Anal. of the starch from these potato lines also indicated a reduced phosphorus content. A very high degree of branching of the amylopectin fraction

was detected by comparison of high and low mol. weight carbohydrate chains after debranching with isoamylase and corresponding HPLC anal. of the products. Brabender viscoamylograph anal. and differential scanning calorimetry of the starches obtained from these transgenic potato lines also indicate a composition and structure much different from typical potato starch. Brabender anal. yielded very low stable paste viscosity values (about 30% of control values), whereas differential scanning calorimetry values indicated reduced enthalpy and gelatinization properties. The above parameters indicate a novel potato starch based on expression of the glgA E. coli gene product in transgenic potato.

AN 1994:319510 HCAPLUS <<LOGINID::20081001>>
DN 120:319510
OREF 120:56089a,56092a
TI Expression of Escherichia coli glycogen synthase in the tubers of transgenic potatoes (Solanum tuberosum) results in a highly branched starch
AU Shewmaker, Christine K.; Boyer, Charles D.; Wiesenborn, Dennis P.; Thompson, Donald B.; Boersig, Michael R.; Oakes, Janette V.; Stalker, David M.
CS Calgene, Inc., Davis, CA, 95616, USA
SO Plant Physiology (1994), 104(4), 1159-66
CODEN: PLPHAY; ISSN: 0032-0889
DT Journal
LA English

L5 ANSWER 14 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Carbon-13 nuclear magnetic resonance studies of chemically modified waxy maize starch, corn syrups, and maltodextrins. Comparisons with potato starch and potato maltodextrins
AB Comparative studies of corn syrups, maltodextrins, chemical modified waxy maize starch, and corn starch were carried out by 13C NMR techniques. Spectral assignments were made for all materials studied and were checked against independent assignments by proton-C correlation spectroscopy. Degrees of branching and polymerization were estimated for maltodextrins from corn starch and were compared with those of potato maltodextrins in relation to differences in gelling behavior and functionally of corn and potato maltodextrins, resp. Chemical shifts were similar for maltodextrins from corn and potato, as well as wheat amylopectin and amylopectin B. A comparison of solid-state 13C NMR spectra of corn, wheat, and potato starches reveals their polymorphism, in terms of the number of glucose rings in the unit cell of the amylopectin crystalline regions of starch granules. Gelatinization causes changes in the symmetry of the crystalline regions of amylopectins inside waxy maize starch granules and/or increased mobility of branches in such regions. A broad band in the anomeric region of the solid-state 13C NMR spectra of waxy maize starch is assigned to the disordered regions of amylopectin in the starch granule structure. Structural details were obtained that are relevant to gelatinization and gelling mechanisms. For corn maltodextrins structural details were obtained concerning the degrees of branching and polymerization, as well as the anomers; such details were significantly different between corn and potato starch maltodextrins.
AN 1991:407164 HCAPLUS <<LOGINID::20081001>>
DN 115:7164
OREF 115:1423a,1426a
TI Carbon-13 nuclear magnetic resonance studies of chemically modified waxy maize starch, corn syrups, and maltodextrins. Comparisons with potato starch and potato maltodextrins
AU Mora-Gutierrez, Adela; Baianu, Ion C.
CS Coll. Agric., Univ. Illinois, Urbana, IL, 61801, USA

SO Journal of Agricultural and Food Chemistry (1991), 39(6), 1057-62
CODEN: JAFCAU; ISSN: 0021-8561
DT Journal
LA English

L5 ANSWER 15 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Carbon-13 dioxide breath test to measure the hydrolysis of various starch formulations in healthy subjects
AB The 13CO2 starch breath test was used to study the effect of physicochem. characteristics of starch digestion. As starch is hydrolyzed to glucose, which is subsequently oxidized to CO2, differences in 13CO2 excretion after ingestion of different starch products must be caused by differences in the hydrolysis rate. To study the effect of the degree of chain branching, waxy starch, containing 98% amylopectin, was compared with high-amylose starch, containing 30% amylopectin, and normal crystalline starch, containing 74% amylopectin. The effect of the extent of gelatinization was studied by comparing extruded starch and crystalline starch. Finally, the possible inhibitory effect of adding wheat fiber to extruded starch on the hydrolysis rate was studied. The 13CO2 excretion for 2-4 h after intake of crystalline starch was significantly lower than that of extruded starch. Waxy starch was hydrolyzed much faster than was high-amylose starch, but there was no significant difference between waxy starch and normal crystalline starch. Addition of wheat fiber did not influence the hydrolysis rate. The 13CO2 starch breath test is an attractive test for the study of factors affecting carbohydrate assimilation.
AN 1990:157113 HCAPLUS <<LOGINID::20081001>>
DN 112:157113
OREF 112:26547a,26550a
TI Carbon-13 dioxide breath test to measure the hydrolysis of various starch formulations in healthy subjects
AU Hiele, M.; Ghoos, Y.; Rutgeerts, P.; Vantrappen, G.; De Buyser, K.
CS Gastrointest. Res. Cent., Univ. Hosp. Gasthuisberg, Louvain, B-3000, Belg.
SO Gut (1990), 31(2), 175-8
CODEN: GUTTAK; ISSN: 0017-5749
DT Journal
LA English

L5 ANSWER 16 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Characterization of starch produced by suspension cell cultures of Indica rice (Oryza sativa L.)
AB Suspension cultures of rice (O. sativa), initiated from seed, produced significant amts. of starch. Starch accumulated in the cultured cells throughout the growth phase and reached a maximum of 7% of the cell dry weight at stationary phase. Starch was present in compound granules which were birefringent under polarized light. Suspension-culture starch had a higher amylose content and a lower gelatinization temperature than rice grain starch. Addnl., starch branching enzyme, an enzyme involved in starch biosynthesis, was characterized by anion exchange chromatog. in culture cells and endosperm. Culture cells had at least 1 major form of starch branching enzyme which differed from the multiple enzyme forms present in endosperm.
AN 1989:21211 HCAPLUS <<LOGINID::20081001>>
DN 110:21211
OREF 110:3565a,3568a
TI Characterization of starch produced by suspension cell cultures of Indica rice (Oryza sativa L.)

AU Landry, Laurie G.; Smyth, D. A.
CS Tech. Cent., Gen. Foods Corp., Tarrytown, NY, 10591, USA
SO Plant Cell, Tissue and Organ Culture (1988), 15(1), 23-32
CODEN: PTCEDJ; ISSN: 0167-6857
DT Journal
LA English

L5 ANSWER 17 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Viscosity and gelation characteristics of hydroxyethyl starch
AB Potato starch (I) had a higher inherent viscosity (η) than hydroxyethylated I, the η of hydroxyethylated I decreased with increasing SD, and native corn starch (II) had a lower η than I and hydroxyethylated I due to its higher degree of branching. The maximum viscosity and its temperature of I were lower than for hydroxyethylated I, and swelling increased with increasing SD. II gelatinized at higher temps. than hydroxyethylated II, the gelation temperature decreasing with increasing SD. The retrogradation of starch was decreased by etherification, e.g. from 22 to 6% for II.
AN 1982:201554 HCAPLUS <<LOGINID::20081001>>
DN 96:201554
OREF 96:33243a,33246a
TI Viscosity and gelation characteristics of hydroxyethyl starch
AU El-Hinnawy, S. I.; El-Saied, H. M.; Fahmy, A.; El-Shirbeeny, A. E.; El-Sahy, K. M.
CS Fac. Agric., Ein Shams Univ., Egypt
SO Starch/Staerke (1982), 34(4), 112-14
CODEN: STARDD; ISSN: 0038-9056
DT Journal
LA English

L5 ANSWER 18 OF 18 HCAPLUS COPYRIGHT 2008 ACS on STN
TI Amyloses
AB High mol. weight amylose was produced by gelatinizing a H2O suspension of up to 15% starch containing up to 50% amylose, adding to the gelatinized starch at 60° and at pH 5.5 an α-1,6-glucosidase from the genus Aerobacter, Pseudomonas, Lactobacillus, or Escherichia, cooling the mixture to 45°, and maintaining the mixture at this temperature for 1-2 days to hydrolyze the branched structure of amylopectin into straight chained amylose. Thus, a 5% aqueous suspension of purified amylose starch was heated to 100° with stirring at pH 6.0 and further heated to 130° in a N stream and stirred for 20 min for gelatinization. Thereafter it was quickly cooled to 45° and the pH was adjusted quickly to 4.5; an enzyme of Pseudomonas was added at a concentration of 50 units of enzyme/g of starch. The mixture was maintained at 45° for 1.5 days; thereafter, the precipitated amylose was separated and vacuum dried. The supernatant was concentrated to half the original volume under vacuum and then kept at 0-5° for 12 hr. The resulting ppts. were separated, washed with warm water, and dried. The yield of the 1st amylose obtained was 40% and that of the amylose from the supernatant 30%, based on the dry raw material. The former amylose has a polymerization degree, as determined with periodic acid, of 780 and the latter amylose a polymerization degree of 130. There was no branching in the former amylose and the latter had on the average 1 branch/mol. Hydrolysis with β-amylase using a 0.5% concentration at pH 6.0 at 55° for 12 hr showed 100% yield of maltose from the former and 85% yield from the latter amylose.
AN 1975:123324 HCAPLUS <<LOGINID::20081001>>

DN 82:123324
OREF 82:19727a,19730a
TI Amyloses
IN Yoshida, Mikihiko; Hirao, Mamoru
PA Hayashibara Co., Ltd.
SO U.S., 3 pp.
CODEN: USXXAM
DT Patent
LA English
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	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	US 3830697	A	19740820	US 1969-854760	19690902	<--
	JP 54031054	B	19791004	JP 1968-63172	19680903	<--
	CA 945492	A1	19740416	CA 1969-60668	19690828	<--
	GB 1286308	A	19720823	GB 1969-43097	19690829	<--
	NL 6913297	A	19700305	NL 1969-13297	19690901	<--
	NL 160614	B	19790615			
	BE 738317	A	19700302	BE 1969-738317	19690902	<--
	FR 2017267	A5	19700522	FR 1969-29890	19690902	<--
	CH 518370	A	19720131	CH 1969-13317	19690902	<--
	DE 1944680	A	19700903	DE 1969-1944680	19690903	<--
	DE 1944680	B2	19790125			
	DE 1944680	C3	19790920			
PRAI	JP 1968-63172	A	19680903	<--		